

Report

Field trials for Gummy Stem Blight Resistance

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Rational:

Gummy stem blight (GSB), caused by a seed born fungus is one of the most serious and devastating diseases of watermelon in the U.S. Because of the importance of this disease to watermelon growers, we included mapping of GSB resistance in a multi-crop Agriculture and Food Research Initiative - Plant Breeding and Education Program Grant proposal submitted in 2009 (proposal# 2009-04819). This successful proposal includes genomic mapping and greenhouse screening of a F_{2:3} population for GSB resistance. However, because GSB resistance in the field and greenhouse is weakly correlated and development of cultivars with field resistance have proved so elusive, we needed to also do replicated field trials for this population. In order to carry out replicated field trails we needed to:

- Develop recombinant inbred lines (RILs) from the current F_{2:3} population and screen these RILs in replicated field trails.
- To add this aspect to our already funded project we requested funds to support half of an assistantship for a graduate student and some limited greenhouse supplies.

Project duration and Objectives

- The anticipated duration of this project was 3 years, from 1 May 2010 to 30 April 2013, with the RIL development taking place in years 1 and 2 and the field trials taking place in years 2 and 3.

- Funding was received for the 1st year (1 May 2010 to April 30 2011) and here we therefore report on the RIL development during the 1st year.

Progress:

- Four seeds of each of 128 F_{2:3} lines from the mapping population were sown in seedling trays. Germination percentage varied from 0% to 100%, with an average of 65%. Low germination is common in watermelon by citron (GSB resistance source) crosses. For all but 5 lines, at least one plant was available for single seed descent RIL development. Seedlings were transplanted into 12 inch pots and grown vertically, trailed on strings in the Horticulture Greenhouses (2500 South Milledge Avenue, Athens GA).
- Plants were selfed and currently fruits are being harvested and seed collected.
- These F_{2:4} seeds are being planted for the next round of selfing.

Outlook:

Our research is proceeding as expected and we anticipate:

- Carrying out an initial field trail with the F_{2:5} generation during the 2011 season.
- Carrying out a replicated field trail during the 2012 season using the F_{2:7} and using the data collected for mapping GSB field resistance.

How funds were used:

- The majority (~81%) of the funding we requested was for 50% of an assistantship for a graduate student. To this end, Kiran Kaur was recruited and started working on this project on 1 May 2010. The majority of the funds used so far were used to pay 50% of her assistantship (the other 50% being paid by the USDA AFRI grant).
 - The following supplies were purchased: 12 inch pots, seedling trays and inserts, fertilizer, labels, and potting soil.
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